<u>WHAT IS CLAIMED IS:</u>

1. A resin microchannel substrate comprising:

a surface having a recess leading to a fluid
supply port and a bank adjacent to the recess and
having many micro grooves on a surface, which grooves
form microchannels connecting an inside of the recess
and an outside of the recess when the surface of the
substrate is firmly attached to a flat plate serving
as a cover,

wherein each of width and height of the
microchannels is within a range of 1 to 300 μm and a
width/height ratio of the microchannels is within a
range of 1:20 to 20:1.

2. A resin microchannel substrate according to
Claim 1, wherein a contact angle of the surface of the
resin microchannel substrate with respect to water is
5° to 60°.

3. A resin microchannel substrate according to
Claim 1, wherein an edge angle of the many grooves on
the surface of the bank is 90° or less.

45

4. A resin microchannel substrate according to Claim 1, wherein the many grooves on the surface of the bank have a fine raised and recessed structure.

5. A resin microchannel substrate according to Claim 1, wherein the resin microchannel substrate is a laminated resin microchannel substrate comprising a plurality of substrates placed on one another in the same direction and in close contact with each other to form many microchannels on a contact surface.

6. A resin microchannel substrate according to Claim 5, comprising a substrate alignment unit used when placing the resin microchannel substrates on one another.

7. A method of manufacturing a resin microchannel substrate of Claim 1, comprising the steps of:

forming a resist pattern on a substrate;

forming a metal structure by depositing a metal according to the resist pattern formed on the substrate; and

forming a resin microchannel substrate by using the metal structure.

8. A filtration and classification method using a resin microchannel substrate of Claim 1, wherein particles are separated by running a particle floating fluid through the microchannels.

5

9. A filtration and classification method using a resin microchannel substrate according to Claim 8, wherein a part to be firmly attached to the surface of the substrate having many grooves is a transparent

10 plate so as to perform filtration and classification while optically observing a separation process in at least part of the many microchannels.

10. A method of producing an emulsion using a

15 resin microchannel substrate of Claim 1, wherein a first fluid is sent from the inside of the recess to the outside of the recess through the microchannels and dispersed in a second fluid supplied to the outside of the recess and not mixing with the first

20 fluid.

11. A method of producing an emulsion according to Claim 10, wherein a part to be firmly attached to the surface of the substrate having many grooves is a

25 transparent plate in at least part of the many microchannels.